

## Device for drying dishes

**Publication number:** DE3741652 (A1)

**Publication date:** 1989-06-22

**Inventor(s):** HESSE PETER DIPL PHYS [DE] +

**Applicant(s):** BAUKNECHT HAUSGERAETE [DE] +

**Classification:**

- **international:** A47L15/48; (IPC1-7): A47L15/48

- **European:** A47L15/48

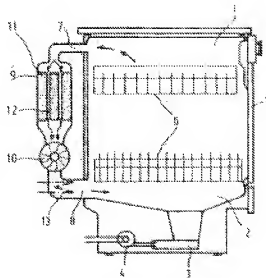
**Application number:** DE19873741652 19871209

**Priority number(s):** DE19873741652 19871209

### Abstract of **DE 3741652 (A1)**

Translate this text

To dry dishes in domestic dishwashers, use is made of a heat exchanger which is thermally insulated from the washing container and is preferably equipped with a latent-heat accumulator.



### Notice:

This translation is produced by an automated process; it is intended only to make the technical content of the original document sufficiently clear in the target language. This service is not a replacement for professional translation services. The esp@cenet® Terms and Conditions of use are also applicable to the use of the translation tool and the results derived there from.

### DESCRIPTION

The invention refers to a mechanism for drying dishes or such, in a winding machine, with which the subject-matters with circulated hot water in the rinsing container, which

can be dried, heated becomes, then the water evacuated and finally the moisture in a closed system condensed.

With dishwashers, in particular such for households, the dish becomes after cleaning in a so-called. Clear rinsing process on a temperature between 50 DEG C and 70 DEG C with the circulated water heated, before a clear detergent is added. The circulated hot water with the clear detergent is then evacuated and thus the drying operation introduced.

Looking at the dish as a closed system, so after a long wait, according to the water from the heated dish is evaporated or evaporated and the condensate has been reflected in the more or less cool walls. Even after prolonged waiting time for this drying method, residual drops remain on the tableware. It has therefore sought in closed systems to create additional condensation surfaces. This can for example take place by the porous plug in the tub of cold water is introduced and is circulated by a fan the air, so that the moisture can condense on the cold water. Another possibility is one of the walls to sprinkle with cold water and catch the cold water in the reservoir basin. By both methods of drying process is greatly improved by increased water consumption, however.

In addition to the closed systems, there are also open systems, where the moisture from the container as is removed by opening the loading door or flap in the area. The disadvantages are obvious. It is also during the dry period so that a reheating temperature drop compared to the more or less cool walls create and improve the drying process. Again, the cost is relatively large, without any really satisfactory drying would be achieved.

The invention is the basis the object to indicate a mechanism for drying dish which works with a closed system, supplies very good drying results and gets along with justifiable effort.

According to the invention becomes the object by the fact dissolved that thermal of the rinsing container isolated with this over channels an heat exchanger in such a manner connected is that the air becomes from the rinsing container by convection and/or guided by a fan over the heat exchanger.

It is particularly favourable to design the heat exchanger as latent heat storages whose fusion crystallization temperatures lie between 30 DEG C and 23 DEG C.

Such latent heat storages are actual known and essentially are with  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$  with nucleating agent filled.

There for a normal household dishwasher approx. 100 g to 150 g water condensed to become to have, a cooling capacity between 0,07 and 0,1 KW/H must become the order provided. This corresponds to a salt quantity of the indicated type of approximately 0.8 to 1.5 litre.

On the basis the drawing an embodiment becomes described and the impact explained.

The dishwasher consists of a rinsing container 1 with a bottom tub 2, which is 4 connected with the sump pumps 3 and a waste water caustic solution pump. The rinsing

container has a front loading door 5 and is in conventional manner with table-ware baskets 6 equipped. At the container 3 two openings are 7 and 8 provided, which connect the rinsing container 1 with a heat exchanger 9. The heat exchanger 9 is 1 thermal isolated arranged in relation to the rinsing container, e.g. when additional with a fan 10 provides flat member at a side wall or the rear, and in the embodiment. By own convection and/or by the fan 10 wet-hot air becomes 9 supplied over the opening 7 the heat exchanger, which flows back then over the opening 8 into the container 1. The heat exchanger 9 is with a latent heat storage 11 equipped, which contains air channels 12. With a fan 10 the circulation and thus the air velocity increased can become. An additional intended heating element 13 can preheat the dehumidified air, whereby the drying effect is improved.

In principle the warm one on common cooling mediums can in the heat exchanger, as waters or air become, transmitted. Mass flow rate and specific heat of the cooling medium determine the temperature increase, which experiences this then. With the described arrangement the warm one becomes melting a suitable substance spent. This substance functions thereby as so-called. Latent heat or phase conversion memory. Important one is the melting point and/or the fusion interval, at which the conversion takes place. For the effectiveness in the heat exchanger as low a melting point as possible desired is, he must however over the room temperature lie, so that the substances erschmolzenen with the drying process can their warm one between the single rinsing procedures to the setting up area deliver and thus again solidify.

In the heat exchanger 9 the steam air mixture extracted the water flows off into the sump 3 of the apparatus and can by the drain pump 4 are evacuated. After passing the fan 10 the cooled down air, whose water content became reduced by condensation, becomes into the container returned. There heated it itself by contact with the dish, the baskets and the container walls. With increasing temperature thereby its relative humidity sinks. Thus again moisture received and the circuit can again be gone through.

The fan 10 is to become in flow direction the rear heat exchanger 9 arranged, since its power in warm ones becomes reacted, i.e. in same way, as the heater specified above works. The arrangement of the fan 10 before the heat exchanger 9 would load this additional thermal. The arrangement of a heater 13 the rear fan 10 is meaningful, in order to load its components, like impellers etc., not uselessly thermal.

The mechanism after the invention improves the drying effect significant, a prevented Vrasenbildung outside of the porous plug and the reduced glass corrosion by rapid removal of the condensate of the glass and by rapid lowering the temperature in the rinsing container.

## CLAIMS

1. Mechanism for drying dishes or such. in a winding machine, with which the subject-matters with circulated hot water in the rinsing container, which can be dried, heated becomes, then the water evacuated and finally the moisture in a closed system condensed,

characterized in that thermal of the rinsing container isolated with this over channels an heat exchanger in such a manner connected is that the air becomes from the rinsing container by convection and/or guided by a fan over the heat exchanger.

2. Mechanism according to claim 1, characterized in that of the heat exchangers from a latent heat storage exists, whose fusion crystallization temperatures lie between 30 DEG C and 23 DEG C.

3. Mechanism according to claim 2, characterized in that of the latent heat storages in actual known way with  $\text{CaCl}_2 \times 6\text{H}_2\text{O}$  with nucleating agent filled is.

4. Mechanism according to claim 2 and 3, characterized in that the salt mixture for household dishwasher a volume of 0,8 to 1.5 litre has.

5. Mechanism according to claim 1 to 4, characterized in that with use of a fan thl. Mechanism for drying dishes or such, in a winding machine, with which the subject-matters with circulated hot water in the rinsing container, which can be dried, heated becomes, then the water evacuated and finally the moisture in a closed system condensed, characterized in that thermal of the rinsing container isolated with this over channels an heat exchanger in such a manner connected is that the air becomes from the rinsing container by convection and/or guided by a fan over the heat exchanger.

6. Mechanism according to claim 5, characterized in that the air channel the rear fan with an additional heating system provided is.